

Date: Thursday, 26/06/2008 9:58:07 AM  
 User: Julie Lecocq

## Process Sheet

<b>Customer</b> : CU-DAR001 Dart Helicopters Services	<b>Drawing Name</b> : 206B AFT X-TUBE
<b>Job Number</b> : 40115	
<b>Estimate Number</b> : 12347	
<b>P.O. Number</b> :	<b>Part Number</b> : D206667201
<b>This Issue</b> : 26/06/2008 <b>S.O. No.</b> :	<b>Drawing Number</b> : D206-667-241 REV B
<b>Prsht Rev.</b> : NC	<b>Project Number</b> : N/A
<b>First Issue</b> : / / <b>Type</b> : CROSSTUBES	<b>Drawing Revision</b> : B
<b>Previous Run</b> : 40114	<b>Material</b> :
<b>Written By</b> :	<b>Due Date</b> : 11/07/2008 <b>Qty:</b> 1 <b>Um:</b> Each
<b>Checked &amp; Approved By</b> : <u>JLD 08-06-24</u>	
<b>Comment</b> : Est Rev:F 05.09.01 Add holes for compatibility with Bell Skidtubes KJ/JLM Est Rev:G 08-06-03 update as per DSI9415 (ECN1198) DD verified by:	

## Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
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1.0	DC	DOCUMENT CONTROL
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**Comment:** DOCUMENT CONTROL

Photocopy bluefile and create labels as per PPP D206-667-201 CHG003

2.0	PACKAGING 1	PACKAGING RESOURCE #1
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**Comment:** PACKAGING RESOURCE #1

3.0	D206667201TRN	Crosstube Turning Detail
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**Comment:** Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

CROSSTUBE TURNING DETAIL

batch B38622

DP

8-7-14

4.0	BENDING	BENDING MACHINE - SKIDTUBES
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**Comment:** BENDING MACHINE

Bend tube as per Dwg D206-667-241 using CNC bender program 206B-AF and Folio FT

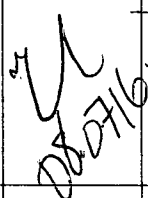
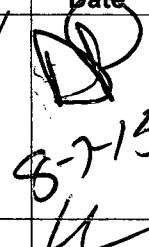
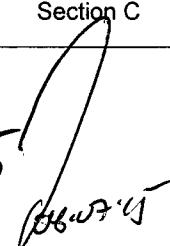
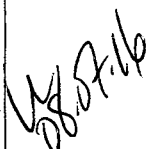
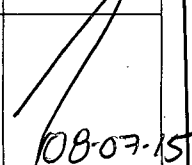
DP 8-7-14

5.0	QC15	DIMENSIONAL CHECK OF X-TUBES
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**Comment:** DIMENSIONAL CHECK OF X-TUBES

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D206-667-201 PAR #: NA Fault Category: \_\_\_\_\_ NCR: Yes ☐ No ☒ DQA: D Date: 08/07/15  
 QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR: <u>40115</u>		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
08-07-15	4.0	Tube was in bend development 1st side is scrap- 2nd side almost acceptable. Side 7 has an inconsistent radius - out of tolerance dimensions.	 08/07/15	Tube is scrap - destroyed <del>given to Eng. Lab for</del> <del>testing.</del>	 8-7-15	 08-07-15	 08/07/15	 08-07-15

NOTE: Date & initial all entries

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Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 206B AFT X-TUBE

Job Number: 40115

Part Number: D206667201

Job Number:



Seq. #:

Machine Or Operation:

Description :

6.0

CROSSTUBES

CROSSTUBES RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Drill pilot holes (3/16") as per Dwg D206-667-241 using drill Jig DT8575 & DT8576

2-Drill & ream holes as per Dwg D206-667-241 using drill Jig DT8575 & DT8576.  
(DRILL 3 HOLES ON BOTH SIDES)

3-Flip tube and switch drilling Jigs from right to left, left to right. Locate tube using "T" pins off holes drilled in previous step.

4-Drill pilot holes (3/16") as per Dwg D206-667-241 using drill Jig DT8575 & DT8576

5-Drill & ream holes as per Dwg D206-667-241 using drill Jig DT8575 & DT8576. Check dimensions between holes on all four sides to ensure proper alignment. Use DT8583 & 8584 SUPPORT Jigs.  
(DRILL 3 HOLES ON BOTH SIDES)

6-Drill rivet holes as per Dwg D206-667-241 using drill Jig DT8788

7-C'sink holes as per Dwg D206-667-241

8-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D206-667-241

9-Scribe part # and batch # using vibrating stylus as per Dwg D206-667-241  
Inside of Cuff(Donot engrave on outside of tube)

7.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

8.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

9.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

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Drawing Name: 206B AFT X-TUBE

Job Number: 40115

Part Number: D206667201

Job Number:



Seq. #:	Machine Or Operation:	Description :
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10.0	OUTSIDE SERV.10	OUTSIDE SERVICES -skids
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**Comment:** Sub-Contracting OUTSIDE SERVICES  
Liquid Penetrant Inspection as per QSI 038Or  
Issue P/O: \_\_\_\_\_  
LPI as per ASTM 1417  
Level 2 Attach copy of NDT results to work order

11.0	PACKAGING 1	PACKAGING RESOURCE #1
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**Comment:** PACKAGING RESOURCE #1  
Inspect for transit damage  
Ensure copy of NDT results attached to work order.

12.0	QC6	DIMENSIONAL CHECK
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**Comment:** Inspect for damage & ensure results are as per Dwg D206-667-103

13.0	SPRAY PAINTING	SPRAY PAINTING
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**Comment:** SPRAY PAINTING

1-Mask Threaded holes

2-Prime inside and outside crosstube as per QSI 005 4.2

3-Paint outside crosstube with White Imron as per QSI 005 4.2

14.0	QC14	INSPECT SPRAY PAINT
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**Comment:** Inspect Spray Paint  
Wrap in plastic bag to protect from scratches

15.0	D3595075395	RUBBER CUSHION .75" x 3.95
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**Comment:** Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)  
RUBBER CUSHION .75" x 3.95  
batch: \_\_\_\_\_

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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Drawing Name: 206B AFT X-TUBE

Job Number: 40115

Part Number: D206667201

Job Number:



Seq. #:

Machine Or Operation:

Description :

16.0

D28911

2.25 Support



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number Description Batch

2 D2891-1 Support \_\_\_\_\_

17.0

MS2192020

Clamp (per MIL-DTL-8783C)



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Pick:

Qty Part number Description Batch

4 MS21920-20 Clamp \_\_\_\_\_

18.0

CROSSTUBES

CROSSTUBES RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Install abrasion strips as per QSI 035 using DT8579.

2-Install supports and clamps as per Dwg D206-667-241. Torque clamps to 80-100 in lb

19.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

20.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Pick Packing Kit

21.0

AN532A

Bolt



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Bolt

22.0

D2872043

Nut Plate Assembly



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number Description Batch

2 D2872-043 Nut Plate \_\_\_\_\_

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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**NOTE:** Date & initial all entries



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## Process Sheet

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Drawing Name: 206B AFT X-TUBE

Job Number: 40115

Part Number: D206667201

Job Number:



Seq. #:

Machine Or Operation:

Description :

23.0

D2872045

Nut Plate Assembly



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number Description Batch

2 D2872-045 Nut Plate \_\_\_\_\_

24.0

AN510A

Bolt



Comment: Qty.: 10.0000 Each(s)/Unit Total : 10.0000 Each(s)

Pick:Packing Kit

Qty Part number Description Batch

10 AN5-10A Bolt \_\_\_\_\_

25.0

AN530A

BOLT



Comment: Qty.: 10.0000 Each(s)/Unit Total : 10.0000 Each(s)

Pick:Packing Kit

Qty Part number Description Batch

10 AN5-30A Bolt \_\_\_\_\_

26.0

AN960JD516

Washer



Comment: Qty.: 20.0000 Each(s)/Unit Total : 20.0000 Each(s)

Pick:Packing Kit

Qty Part number Description Batch

20 AN960JD516 Washer \_\_\_\_\_

27.0

MS21042L5

Nut



Comment: Qty.: 10.0000 Each(s)/Unit Total : 10.0000 Each(s)

Pick:Packing Kit

Qty Part number Description Batch

10 MS21042L5 NUT \_\_\_\_\_

28.0

QC4

INSPECT 100% KITS FOR COMPLETENESS



Comment: INSPECT 100% KITS FOR COMPLETENESS

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

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Job Number: 40115

Part Number: D206667201

Job Number:



Seq. #:

Machine Or Operation:

Description :

29.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and pack for shipping as per PPP D206-667-201

Location: \_\_\_\_\_

PPP Rev: \_\_\_\_\_

30.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

Job Completion



#00233A

mf 08-07-15

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

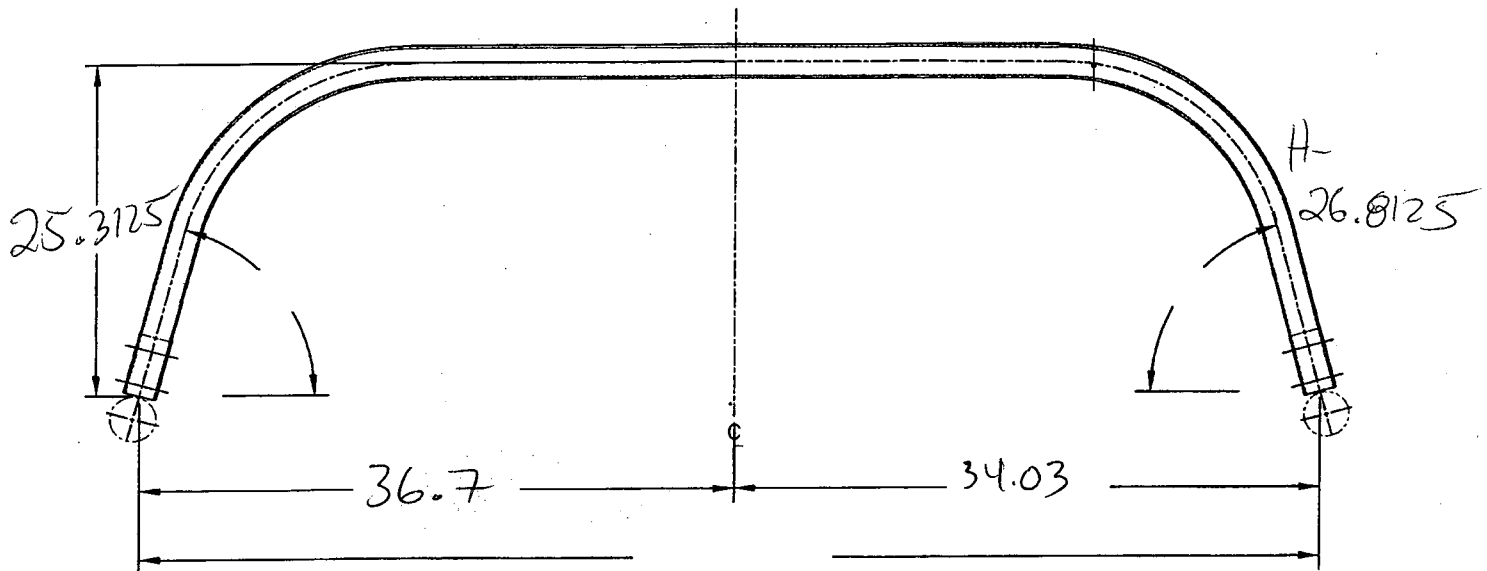
QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD		Work Order:	40115
Description: Crosstube High Aft (206B)		Part Number:	D206-667-201
Inspection Dwg: D206-667-241 Rev: B		Page 1 of 1	

Required Dimension	Min	Max
Height	24.98	25.10
1/2 Span	36.54	36.66
Angle	65	67
Total Span	73.08	73.32



Comments
Scrap

QC15 Inspection	
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	07.12.04	24-98 was 24.48	KJ/JM	

<b>DART AEROSPACE LTD</b>		<b>Work Order:</b> 4065
<b>Description:</b> Crosstube Assembly		<b>Part Number:</b> D206-667-241
<b>Inspection Dwg:</b> D206-667-241 <b>Rev:</b> B		<b>Page 1 of 1</b>

### FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article
 ☐ Prototype

Inspection Sheet Drawing Dimension		Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	30° x 0.500	+/-0.010					
	0.250	+/-0.010					
	2.240	+0.005/-0.000					
	4.438	+/-0.030					
	1.780	+0.005/-0.000					
	R0.063	+/-0.010					
	1.851	+0.005/-0.000					
	1.928	+0.005/-0.000					
	2.005	+0.005/-0.000					
	2.082	+0.005/-0.000					
	2.159	+0.005/-0.000					
	2.190	+0.005/-0.000					
SIDE B	30° x 0.500	+/-0.010					
	0.250	+/-0.010					
	2.240	+0.005/-0.000					
	4.438	+/-0.030					
	1.780	+0.005/-0.000					
	R0.063	+/-0.010					
	1.851	+0.005/-0.000					
	1.928	+0.005/-0.000					
	2.005	+0.005/-0.000					
	2.082	+0.005/-0.000					
	2.159	+0.005/-0.000					
	2.190	+0.005/-0.000					
	100.60	+/-0.020					

<b>Measured by:</b>		<b>Audited by:</b>		<b>Prototype Approval:</b>	N/A
<b>Date:</b>		<b>Date:</b>		<b>Date:</b>	N/A

Rev	Date	Change	Revised by	Approved
A	06.10.16	New Issue (P/O D206-667-201)	KJ/JLM	BE

**DART**

DESIGN PH	DRAWN BY PH	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
CHECKED [Signature]	APPROVED [Signature]	DRAWING NO. D206-667-241	REV. B SHEET 1 OF 3
DATE 05.02.04		TITLE CROSSTUBE ASS'Y (206B HIGH AFT)	SCALE NTS
A	00.11.17	NEW ISSUE	
B	05.02.04	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	

**RELEASED**  
05.06.16 [Signature]

Qty	Part Number	Description
X	D206-667-241	CROSSTUBE ASSEMBLY (206B HIGH AFT)
1	D6003-102	CROSSTUBE
2	D2856-400-694	ABRASION STRIP
2	D2891-1	SUPPORT
4	MS21920-20	CLAMP

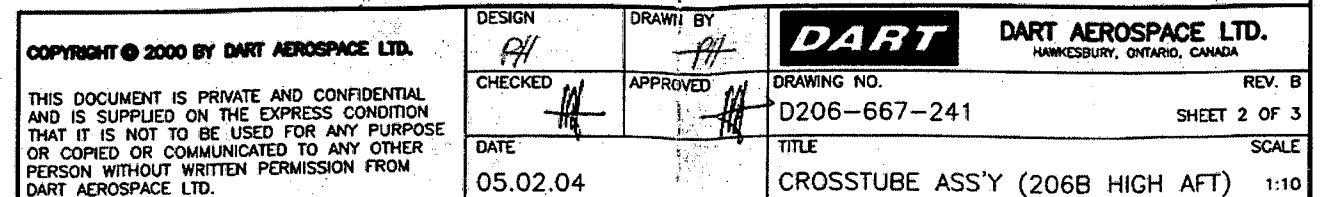
**GENERAL NOTES:**

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 2) MATERIAL: MANUFACTURED FROM D6003-102  
FINISHED LENGTH =  $100.60 \pm 0.020$
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE
- 5) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALY, TRANSITION SHOULD BE SMOOTH.
- 6) BEND PROGRESSIVELY WITH A MINIMUM OF 12 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL D2856-400-694 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE, CENTERED OPPOSITE D2891-1 SUPPORT, PER QSI 035.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) IT IS OPTIONAL TO SEAL EDGES OF SUPPORTS AND ABRASION STRIP USING SIKAFLEX-241/291 SEALANT.
- 12) TORQUE CLAMPS 80 TO 100 IN-LB.

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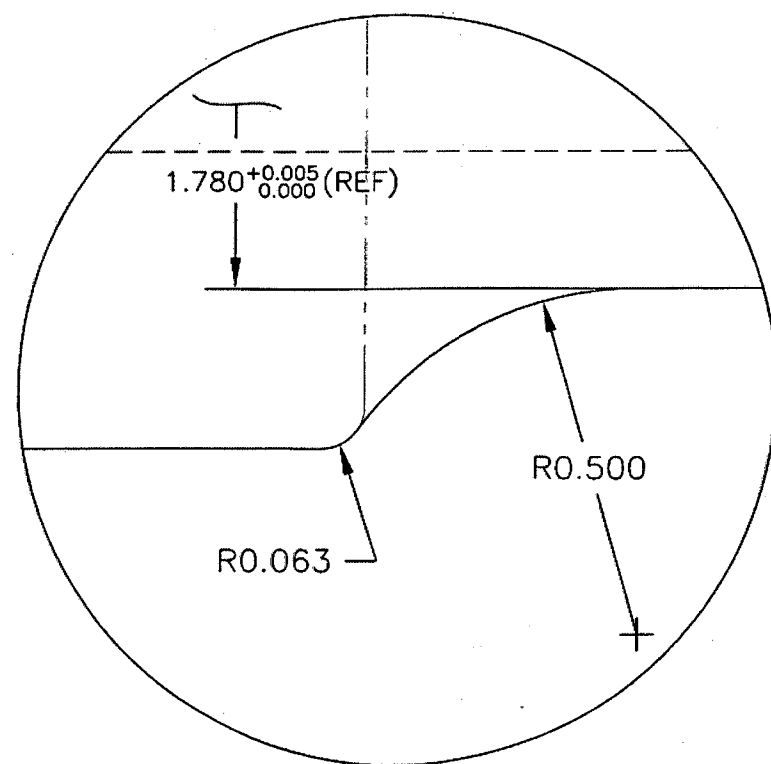
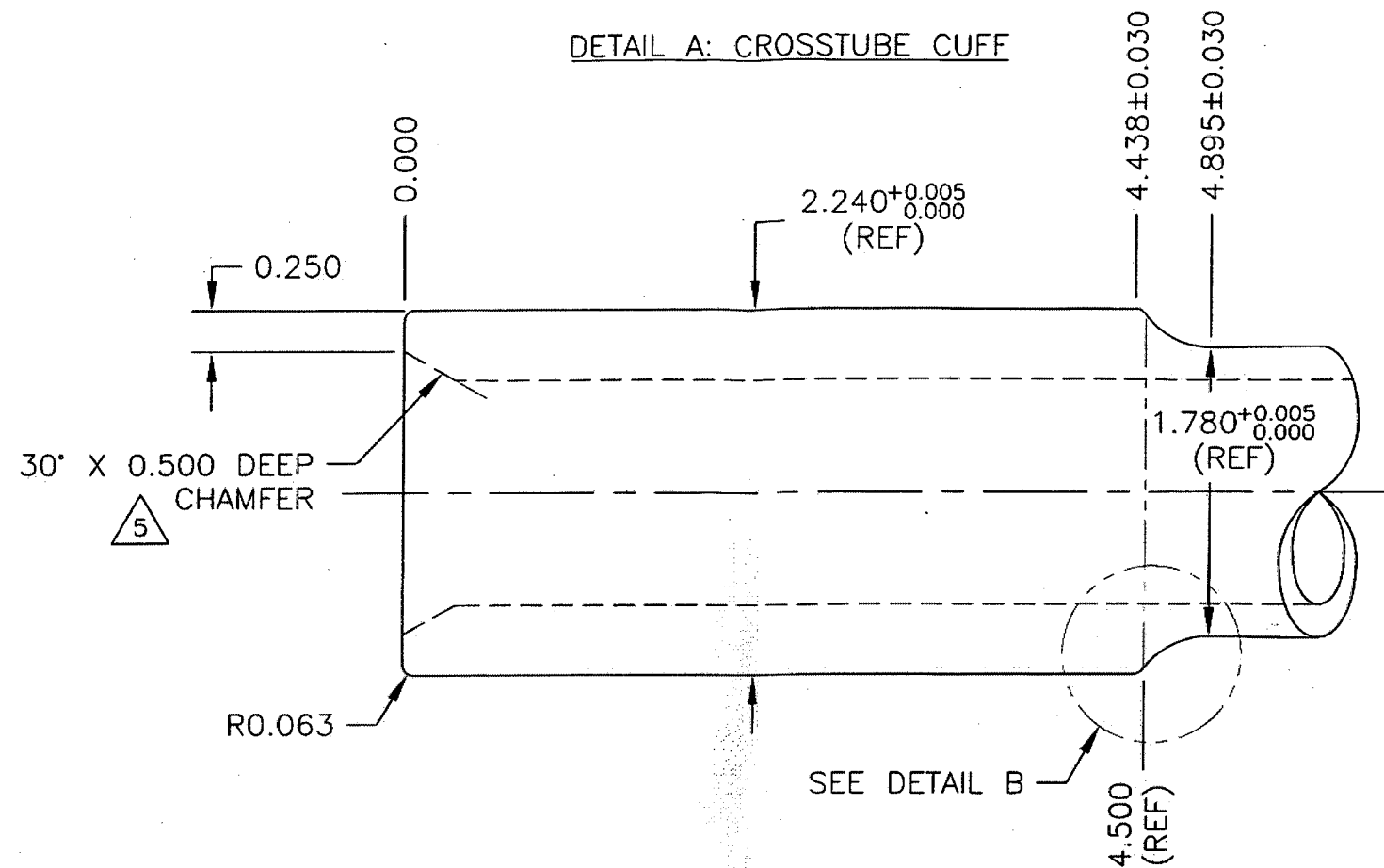






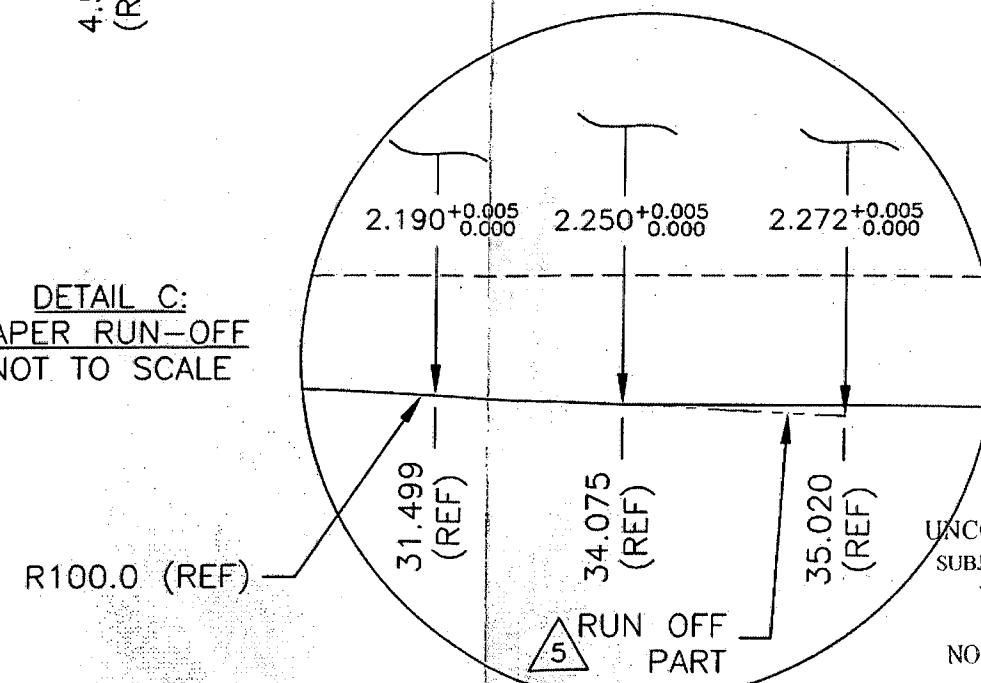
RELEASED  
05-06-16

DETAIL A: CROSSTUBE CUFF



DETAIL B: CUFF  
TRANSITION  
SCALE 4:1

DETAIL C:  
TAPER RUN-OFF  
NOT TO SCALE



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NO. 40115

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DESIGN PH	DRAWN BY PH	<b>DART</b>	DART AEROSPACE LTD. HAWKESBURY, ONTARIO, CANADA
CHECKED PH	APPROVED PH	DRAWING NO. D206-667-241	REV. B SHEET 3 OF 3
DATE 05.02.04		TITLE CROSSTUBE ASS'Y (206B HIGH AFT)	SCALE 1:1

